15¢

FEBRUARY 18, 1950

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

LIBRARY
FEB 2 1950
DETROIT

"Near Zero" Behavior

See Page 103

A SCIENCE SERVICE PUBLICATION

VOL. 57 NO. 7 PAGES 97-112

MEDICINE

Drugs Fight Cancer's Pain

➤ DEATH may bring the only complete relief from the pain of advanced cancer. But doctors have weapons against this pain. The list includes morphine and several newer, powerful drugs, nerve and brain operations, alcohol injections, hypnosis and psychology.

A good example of the psychological weapon against pain comes from methods being tried at Yale University Medical School and elsewhere for relief of the pain of childbirth. You have read about it as "natural childbirth." Part of the method consists in teaching expectant mothers what to expect and so to abolish their fear.

Fear is an important component in pain. When it can be eliminated, the suffering is less. And the pain in the second stage of childbirth registers ten and a half dols, which is the top of the pain scale developed by scientists at New York Hospital-Cornell Medical Center.

Psychiatrists recognize distraction as one of our fundamental defenses against suffering. Amnesia, or loss of memory, is an example of the way in which distraction is sometimes used as a defense against painful experiences. A more familiar example is sleep. You have undoubtedly heard someone say he is going to sleep to forget his troubles, or he is going to sleep off a headache.

Of the newer pain-relieving drugs, metopon is considered one of the most useful for advanced cancer. Like morphine, it must be used judiciously, because patients develop tolerance to it. This means that more of the drug, and still more is needed to relieve the pain. Eventually it may not have any effect at all.

The pain varies from day to day. The wise doctor, and the wise patient, recognize that it is better to have a little pain today than a lot next week. So the doctor will not give a larger dose immediately when the patient starts worrying because he has more pain today. He waits to see whether the pain is not a little better tomorrow.

This matter of the worry over pain has been relieved in some cases of advanced cancer by the brain operation, lobotomy. Devised originally for mentally sick patients, it has been described as removing the "worry center." Actually nothing is removed in the operation. The surgeon merely cuts nerve connections in the frontal lobes of the brain. In depressed patients this seems to stop the chain of troubled thoughts and relieve the patient's deep unhappiness. When used for intractable pain, it does not stop the pain but does stop the patient's concern over it. Patients say they still feel the pain but it "does not bother" them any more. Although considered a relatively simple operation, its results are not uniformly successful.

Another kind of nerve-cutting operation has also been used, with success in some cases, for relief of intractable pain. This consists in cutting the nerves to the part of the body where the cause of the pain is located. Injecting alcohol into the nerve carrying the pain sensation helps in some cases.

Science News Letter, February 18, 1950

AERONAUTICS

Jetliner To Cross Atlantic

➤ A VISIT to England is to be made in September by the new Canadian jet-propelled, 50-passenger airliner, the A. V. Roe Canada Limited, its builder, has announced. Jet fighters have crossed the Atlantic, but no jet-propelled craft of the airliner type or bombers have as yet done so.

A British jet-propelled airliner recently made a successful test flight from its home station to North Africa and back. A giant American jet-propelled bomber has made a non-stop flight across the American continent. The planned flight of the Canadian Avro Jetliner, as this first jet transport built in the Western Hemisphere is called, will be one step in determining if speedy jet planes may sometime become standard craft on trans-oceanic flights.

The Avro Jetliner is powered by four jet turbine engines and is designed to carry 50 passengers at 430 miles per hour and fly at an altitude of 30,000 feet. The plane has already made many test flights. It handles easily in the air, its flight pilots declare. It does not require long take-off and landing runs, contrary to some predictions. Present runways can be used.

The Jetliner will be safer for many reasons, Avro officials believe. It uses a less volatile fuel than the gasoline used in conventional aircraft engines, with consequently less danger of fire. It will be very comfortable because it will fly high above ordinary weather conditions. Less noise and the absence of vibration will add to comfort. Speed, however, is its primary advantage.

The United States has a number of jet-propelled bombers that are as large as transports. The American airplane industry has the fundamental knowledge necessary to design and construct jet-propelled airliners. Designs satisfactory for bombers probably can not be used. Special designs will be required. Several are on the drafting boards, it is reported.

Actual construction of an American jetliner is delayed by the cost. Certain manufacturers seem to think that the federal government should give financial aid in the development and construction of early types. They point out that jetliners developed for civil transports could be used for war purposes in an emergency.

Science News Letter, February 18, 1950

INVENTION

Sound Waves Help Blind Men Dodge Obstacles

➤ SOUND waves too high in pitch to be heard by the normal ear are put to work in a device to help blind men dodge obstacles as they walk about, for which a government patent was recently issued.

Ultrasonic waves, as such high-pitched sound waves are called, are sent out from a mechanism in the blindman's walking cane. Waves reflected from an obstacle ahead are picked up by a receiver on the cane. Their energy is converted into electric pulses that travel by wire to the ear where, by means of a type of microphone, the pulses are translated into audible sound.

A miniature electric battery, carried on the person of the user, provides the needed electric energy for operation. The sound waves are created by an electric device, or by a pneumatically operated whistle which acts when the end of the cane is pressed against the pavement.

The inventors of this aid to the blind are John W. Richardt, Jr., Terre Haute, Ind., and Oscar A. Shann, Short Hills, N. J. Rights have been assigned to Bell Telephone Laboratories, Inc., New York City. Patent number is 2,496,639.

Science News Letter, February 18, 1950

MEDICINE

False Heart Disease By Hypnotic Suggestion

➤ BEING hypnotized can make the heart beat faster. In some persons suggestions of anger and anxiety under hypnosis can cause heart signs like those in true heart disease.

This was found in experiments with five students at the University of California Medical School. The students had no real heart disease. Neither were they neurotic or anxiety ridden, conditions which sometimes cause symptoms like those of heart disease.

The studies were made by Dr. Leslie L. Bennett of the medical school in San Francisco, Calif., and Dr. Norman E. Scott of the University of Texas at Galveston. The physicians state that the results show some of the difficulties in diagnosing true heart disease and the importance of considering the patient as a whole.

Science News Letter, February 18, 1950

PSYCHOLOGY-PSYCHIATRY

Mind vs. Hydrogen Bomb

Atomic scientists, government leaders and military men need the aid of psychologists and psychiatrists in assaying the H-Bomb crisis.

By WATSON DAVIS

➤ NOW that the H-bomb has exploded the atomic "cold war" to a new crisis, how about calling in the psychologists and psychiatrists to help the physicists, diplomats and military men?

There is far more to the critical situation than hydrogen, deuterium, plutonium —or aircraft carriers, world-girdling bombers, and guided missiles.

Minds of men, feelings of masses of peoples, customs of the centuries, the lack of information or the misinformation behind and before the iron curtain—these are ingredients of the impending explosion in international relations that can now trigger city-destroying atomic energy.

When we are sick it is but human not to want to see the doctor. The world is sick, with fear, anger, and desperation, but we flex our nuclear muscles to convince ourselves that we are strong, unafraid, and can lick anyone who puts up his atomic fists.

The practitioners who treat sick human minds and feelings are modest people, preoccupied with individual human troubles. Only occasionally are they bold enough to prescribe for the world, for they realize the magnitude of the task and the lack of certainty of a cure for the disease of impending war.

No one in high place in our government is seeking their advice upon what may prove the crisis of civilization. Yet all of us have questions to ask the psychologists and the psychiatrists, especially those who have dealt with lives influenced by the ideas and spirit of the Communist-dominated, dictator-ruled world.

Could a hundred H-bombs devastating Russia or the USA bring peace to the world? Would $50,000,000,000 (McMahon's proposal) buy immunity to an atomic arms race? Is it hunger in the stomach or the thirst for security that turns peoples toward communism or toward reliance on a dictator? Do cancers of intolerance, prejudice and money greed in our own country infect our ability to achieve world peace? How far can the word of a ruler, like Stalin, be trusted? If the group around Stalin were wiped out, would it change the cold war?

Some of these questions (and everyone can add more) are spot and transitory, while others are basic. The diagnosis of the doctors on some of the symptoms may be indefinite, but they may have mental, social or political medicine to suggest that may not be available to congressmen, generals and admirals, or cabinet members.

While the war was still on, before the first atomic bomb was exploded, 2,000 psychologists agreeing 99.4% told us about human nature and peace. In the present crisis some basic principles then presented are pertinent:

War can be avoided. War is not born in men, it is built into men.

In planning for permanent peace, the coming generation should be the primary focus of attention.

Racial, national, and group hatreds can, to a considerable degree, be controlled.

Condescension toward "inferior" groups destroys our chance for a lasting peace.

The root-desires of the common people of all lands are the safest guide to framing a peace.

The trend of human relationships is toward ever wider units of collective security.

"Neglect of basic principles may breed new wars," said the psychologists in 1945, "no matter how well-intentioned our political leaders may be."

A lot of atoms have been split in the past five years. There are new ingredients in the international caldron. If such experts take a new look at the situation, something may come of it.

Above all, it must be a careful, unemotional look with the attitude of the research worker and the clinician. Protagonists and minds-made-up will not be effective in any such consultation upon the mentally disturbed world. And the consultation may not come too late.

Science News Letter, February 18, 1950

NUCLEAR PHYSICS-ENGINEERING

For A-Bomb-Proof House, Build To Resist Quake

➤ BUILD your new house or factory to withstand the most violent hurricane or the strongest earthquake and it may stand up under a half-mile distant blast of an old-fashioned fission atomic bomb.

But the government's tentative recommendations on building and bridge construction to resist atomic blasts are admittedly of pre-hydrogen bomb vintage.

HOW SPEEDY THE JUMP?—A time interval meter electrically measures the speed of ski jumper Arthur Devlin, one of America's leading jumpers. The device casts two parallel light beams across the lip of the take off and measures the elapsed time between the break of the two beams by the skier's body. The speed was found to average from 46.4 to 55.1 miles per hour.

What, if anything, will stand up under the H-bomb is a question for the future.

For several years now the Department of Defense and the Atomic Energy Commission have been compiling a handbook on atomic weapons. Part of it is this study on atomic explosion damage. It admits that fixing up old buildings to resist the air blast of an atom bomb is "a much more difficult problem" than building new buildings for safety. Just as earthquake experts do not like cornices and trim that may fall on the heads of passersby, the atomic damage experts suggest the removal of such dangerous decorations.

Reinforced concrete or steel frame buildings are favored, and they should be designed for a horizontal push from the wind blast of 90 pounds per square foot and a push downward of 70 pounds per square foot to protect them from collapse. In case of an atomic explosion there is a sudden inward pressure, then about two seconds later a suction or pressure in the other direction not quite so strong.

Science News Letter, February 18, 1950

POPULATION

Density of Ancient Mexico

➤ CENTRAL Mexico is now credited with having a greater population density at the time of its conquest by Cortez than the most populous modern American states have today.

A study by two University of California professors indicates that Central Mexico in 1519 had a native population of 11,000,000. This is in sharp contrast with the 4,000,000 to 4,500,000 estimates of most modern scholars. The population of the area today is about 13,000,000.

Dr. Sherburne F. Cook, professor of physiology, and Dr. Lesley B. Simpson, professor of Spanish, said the average density of population in 1519 for the whole area was about 60 to 70 per square mile. This is about the same population as modern Michigan and Indiana have.

More populous local areas were the Valley of Mexico, the seat of the Indian cultures, which had about three times as many people per square mile as did Rhode Island in 1940. In that year Rhode Island had 674 persons per square mile, the densest population of any of the states. Tlaxcala, a province of about the same size as Rhode Island, had in the sixteenth century about the same density of population as that state had in 1940.

Some of the data come from unpublished Spanish archives which were made available to the two professors. They identified more than 1600 Indian communities of importance existing at the time of the conquest. These communities contained about 90% of the population.

Their figures come from three sources. First, they gathered contemporary clerical data, including baptisms. Second, they used estimates of Cortez and his associates on the sizes of native armies. Third, they selected representative towns for which reliable data were available both for 1519 and 1565, established a ratio between these periods and then applied these ratios to the whole of Central Mexico. The results of all three methods were in good agreement.

The differences between their figures and those of other modern scholars is explained by Drs. Cook and Simpson as follows:

"This violent discrepancy arises from the conviction among most scholars that the ancient observers were not to be trusted —a conviction which we do not share— and from their resultant habit of dividing early estimates by some arbitrary factor, ranging from two to five. It seems to us that if the testimony of respectable witnesses can be discarded so easily, then all history would have to be rewritten in the light of later assumptions."

Science News Letter, February 18, 1950

Question Box

AERONAUTICS-ENGINEERING

How will the airport recorder aid in preventing crashes? p. 101.

CHEMISTRY-PHYSICS

What is the quality of helium known as second sound? p. 103.

MEDICINE

What is the most useful new drug in fighting cancer? p. 98.

NUCLEAR PHYSICS

What is the HT reaction? p. 101.

POPULATION

What was the population of ancient Mexico? p. 100.

PSYCHIATRY

How is the psychiatric care of veterans threatened? p. 102.

PSYCHOLOGY-PSYCHIATRY

What is the great need in the H-bomb crisis? p. 99.

Photographs: Cover, National Bureau of Standards; p. 99, General Electric; p. 101, Rebman Photo Service; p. 103, Avro Canada; p. 106, U. S. Weather Bureau, L. E. Johnson.

● RADIO

February 25, 1950, 3:15 p. m., EST

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Joseph E. Smadel, Chief, Department of Virus and Rickettsial Diseases, Army Medical Department Research and Graduate School, Army Medical Center, will talk on "Chloromycetin, Conqueror of Disease".

SCIENCE NEWS LETTER
VOL. 57 FEBRUARY 18, 1950 No. 7

50,900 copies of this issue printed

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change, please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1950, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAte 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horovitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Sciences; Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; L. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: H. L. Smithton, E. W. Scripps Trust; Frank R. Ford, Evansville Press; Charles E. Scripps, Scripps Howard Newspapers.

Officers—President: Harlow Shapley; Vice President and chairman of Executive Committee: Alexander Wetmore; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, A. C. Monahan, Marjorie Van de Water, Ann Ewing, Morton Stark, Wadsworth Likely, Margaret Rallings. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

NUCLEAR PHYSICS

Hydrogen-Tritium Bomb

Hints point to a super-bomb of hydrogen and tritium. Tritium is very rare and can only be produced by the few existing uranium piles in the world.

➤ THE super bomb will probably be known as the HT-bomb. HT for hydrogen-tritium, the reaction likely to be used in the bomb, and HT, of course, for Harry Truman.

The hydrogen-tritium reaction was made public nine months ago at a meeting of the American Physical Society in Washington by six scientists of the Los Alamos Atomic Energy Commission laboratory.

The reaction between hydrogen protons and tritium, which is hydrogen that is three times as heavy as ordinary hydrogen, produces helium and billions of electron volts of energy.

The scientists told the assembled physicists how they bombarded atoms of tritium with accelerated hydrogen protons in the laboratory. The result of the bombardment of each atom of tritium was one atom of helium and gamma rays carrying 20,000,000 electron volts of energy. It is this energy which will be the punch of the HT-bomb.

The six scientists who delivered the paper are H. V. Argo, H. T. Gittings, A. Hemmendinger, G. A. Jarvis, H. Mayer and R. F. Taschek.

Tritium is a very rare material which is not found in nature and which can only be produced in the few uranium piles now existing in the world. The uranium piles also produce plutonium, which is essential in the manufacture of the old-type A-bombs. It is believed that the piles produce even less tritium than plutonium.

There is another hydrogen-helium reaction which might be used—that between deuteron and deuteron, called the D-D reaction. Deuterium, from which deuterons come, is only twice as heavy as ordinary hydrogen.

However, deuterium is relatively plentiful. Tons of it have been manufactured and anyone can buy heavy water, take out the oxygen and have plenty of deuterium.

It would seem that if deuterium were the super bomb material, it would have been manufactured and tested long ago.

A hint that such a critical and rare material as tritium will be used in the HT-bomb came in the "$50,000,000,000" speech of Chairman Brien McMahon of the Congressional Atomic Committee on Feb. 2. He said, "The scientific facts surrounding the hydrogen bomb more than ever render necessary the general kind of technical program which the United Nations, after exhaustive study, has approved." That program, the Baruch plan, was based on the case of keeping track of all sources of rare plutonium. It could easily be adapted to controlling by inspecting all uranium piles which produce the even rarer tritium.

The Baruch program, however, could not begin to control all sources of deuterium which already is manufactured easily and in very great quantities.

Sen. McMahon went on to say that, "more than ever there is no escape from strict control of raw materials, strict control of plants, and continuous inspection." It would be impossible to get the manufacture of deuterium back into any kind of control.

The Los Alamos physicists of course did not tell the scientists at last April's Physical Society meeting that the HT reaction will be the basis of the HT-bomb. They merely reported their observation and measurement of the energy released when a hydrogen proton hits an atom of tritium.

Their laboratory experiment, also, was in no sense like what would happen in an HT-bomb. They probably used a well-known laboratory machine to speed up the protons somewhat so that when they were aimed at the tritium atoms they would stand some chance of penetrating into the heart of the tritium atoms.

It is certain that, in the experiment, only a few tritium atoms fused with the hydrogen protons aimed at them and thus released energy.

In order to make sure that most or all the atoms in a mass of tritium would fuse with the protons, an intense heat would have to be created. So far, this can only be done by setting off an old-fashioned uranium-plutonium bomb.

Science News Letter, February 18, 1950

AERONAUTICS-ENGINEERING

Crashes May Be Reduced

➤ FOURTEEN two-way conversations may be recorded at the same time on a single magnetic paper tape less than three-quarters of an inch wide in a new ingenious machine for use in airport control.

It is a machine to make complete recordings of all communications between control tower operators and pilots in planes,

AIRPORT RECORDER—The ingenious machine makes possible for the first time a permanent record of all communications between pilots and control towers, thus permitting a detailed study of factors leading to air crashes. Hailed as a great advance in aviation safety, it records up to 28 voices on a single magnetic paper tape less than three-quarters of an inch wide.

recording both out-going and in-coming signals and words. It utilizes 14 wavelength channels and all may be used at the same time.

The records are permanent. With them, no disputes can arise following a crash relative to instructions given to a pilot and the pilot's answers. A record of communications during an emergency can not prevent accidents, but a reliable record for use in an investigation will provide investigators with information that may be of help in preventing future accidents.

This new two-way recorder is a product of the Brush Development Company, Cleveland, Ohio, and will be known as the Brush Airport Recorder. The complete unit is made to mount on three seven-and-a-half-foot standard relay tracks. The first rack includes two complete tape transport mechanisms, and the master recorder control panel.

The second rack contains a third tape transport mechanism and the complete electronic set-up for the entire recorder. The third rack contains the play-back and speaker unit.

Each reel of recording tape will run for over four hours, and will automatically start a second reel before the first is finished. This means eight hours of unattended operation.

Science News Letter, February 18, 1950

PSYCHIATRY

Threat to Veterans' Care

➤ THE quality of service to veterans needing psychiatric and neurologic care is threatened by some of the economy measures now proposed, the American Psychiatric Association warned in New York.

"Indefensible on scientific or humane grounds" are the terms applied to the proposed measures by this organization of 5,300 physicians who make up the bulk of the practicing psychiatrists of the United States and Canada.

"New hospital construction without competent personnel will not provide adequate care for sick human beings," the association's governing council states.

"Current demands that additional hospitals, 16,000 beds (7,000 neuropsychiatric), be constructed beyond the availability of professional personnel in places away from medical centers and in the face of present trends of reduction of personnel ceilings and lowered financial appropriations must result in a deterioration of good medical care to the veteran."

"Unless the Veterans Administration—and behind it the Congress and the voters—are prepared to recognize the value of well administered programs and the direct as well as the long term economy of early diagnosis and appropriate care, the public might well stand advised that inefficiency, frustration, and general deteriorations in the neuropsychiatric care of veterans will rapidly set in."

Situations which the association feels are particularly threatening to the best interests of disabled and sick veterans are:

1. Elimination of Branch offices, thus reducing supervision at the field level, with danger of further restrictions.

2. Decrease in funds for travel and consultation, thus cutting down the frequency, availability, and quality of medical supervision.

3. Continued construction of hospitals in isolated areas; thus resulting in staffing problems, forced transfer of physicians to these hospitals, secondary resignations and disturbed morale.

4. Proposed cut for outpatient clinic care will result in increased hospitalizations and decreased care in the community.

5. Lay executive officers have become assistant managers, i.e., acting managers in the absence of managers; thus the very real danger exists of medically untrained nonprofessional personnel assuming control of the care of sick veterans.

Science News Letter, February 18, 1950

ENGINEERING

Pulverized Coal Fuels Steam-Electric Station

➤ PULVERIZED anthracite, some 600,000 tons annually, is fuel for the new 150,000 kilowatt steam-electric station just erected near Sunbury, Pa., on the Susquehanna river. It is a giant plant, costing $31,000,000, and will feed the energy created into the 6,000,000 kilowatt interconnection from Staten Island, N.Y., to Washington, D.C.

To burn this face-powder fine coal, more than 432,000 cubic feet of air per minute are required to keep the furnace fires roaring, the American Society of Mechanical Engineers was told in Washington, D.C. by George M. Keenan, Melvin D. Engle and Stanley C. Townsend of the Pennsylvania Power and Light Company. Condensers need 93,000 gallons of water per minute for cooling. Four years were required for construction.

Science News Letter, February 18, 1950

MEDICINE

Leukemia Cells Build Resistance to Drugs

➤ DEVELOPMENT of drug resistance by leukemic cells may be the reason why leukemia patients get only temporary improvement from treatment with anti-folic acid chemicals such as aminopterin and amethopterin.

Complete resistance to one of these drugs has been brought on in one strain of leukemic mice by continued treatment, generation after generation, although untreated mice from the same strain continued to be sensitive to the effects of the drug.

The experiments which led to development of this drug resistance in the leukemic mice are reported by Drs. J. H. Burchenal, E. Robinson, S. F. Johnston and M. N. Kushida, of the Sloan-Kettering Institute for Cancer Research in New York, in the journal, SCIENCE (Feb. 13).

Cells of the drug-resistant and sensitive mice show no difference in size and structure. The scientists are now trying to learn whether there are chemical differences in the cells.

Science News Letter, February 18, 1950

ENGINEERING

200,000 Revolutions Per Minute Expected in Wheels

➤ SPEEDS up to 200,000 revolutions per minute are expected in new tiny grinding wheels for use in ultra-precision metal shaping, W. W. Goehring, SKF Industries, Inc., revealed in Philadelphia, Pa.

Spindle speeds of some grinding machines can now attain 100,000 revolutions per minute, he said, but these speeds are being doubled in current tests. The higher rates are made possible by stronger and more versatile metals, precision ball and roller bearings and improved lubricants.

Delicate parts for precision instruments must be ground and polished to extremely exact measurements. The grinding and polishing tools must revolve at ultra high speeds if proper accuracy in dimensions is to be obtained. The new high-speed grinders are for use in meeting current demands for various instruments of ultra-high precision.

Science News Letter, February 18, 1950

Words in Science—MAGNESIUM-MAGNESIA

➤ MAGNESIUM is a light metal, used as an alloy with aluminum for airplane construction. When heated to about 800 degrees Centigrade, it gives off a brilliant white light and thus is the material used for photographic flash bulbs and, sometimes, for signalling. Magnesium, one of the elements, is never found in nature by itself; it is always in combination with other elements.

Magnesia is a result of one of these combinations, a magnesium oxide, a light earthy white substance obtained by heating magnesium hydroxide. The familiar "milk of magnesia" is magnesium hydroxide suspended in water.

Science News Letter, February 11, 1950

CHEMISTRY-PHYSICS

Helium Debate Settled

Second sound, the velocity of heat transmission at a very low temperature, is a quality of helium. A rise in the transmission speed of the sound occurs near absolute zero.

See Front Cover

➤ AN international controversy about helium has just been settled by scientists at the National Bureau of Standards. This international controversy is on the behavior of helium at the low end of the temperature scale.

Dr. J. R. Pellam and R. B. Scott investigated the behavior of helium near absolute zero. At room temperature, helium, second lightest of all elements, is a gas. It changes from a gas to a liquid at only 4.2 degrees Centigrade above absolute zero.

Absolute zero is the coldest temperature possible, 459.6 degrees below zero on the Fahrenheit scale or 273.16 degrees below zero on the Centigrade scale. At this temperature random motion of atoms and molecules ceases. At normal room temperatures atoms and molecules dash about at high speeds. The higher the temperature, the more motion the molecules have.

For the first time, through the use of a temperature-sensitive device, Dr. Pellam and Mr. Scott have made scientific measurements of the velocity of heat transmission at temperatures within one and one-third degrees Centigrade above absolute zero. This quality is known as second sound.

This phenomenon occurs only, so far as is known, in helium at extremely low temperatures. It is the term applied to the almost magically rapid heat transfer of helium.

The controversy concerned whether there would be a rise or a fall in the speed of transmission of this second sound when the temperature was less than one and one-third degrees Centigrade above absolute zero.

At room temperature, heat is transmitted when the atoms and molecules hit each other in the random motion.

This process takes time. At temperatures near absolute zero, however, the process is almost instantaneous. The scientists found that there was a definite, very smooth rise in helium.

The heat is transmitted very quickly by means of a peculiar kind of wave motion. Because this motion is similar to that of sound waves, the process of heat transfer is called "second sound."

When the temperature rises more than two degrees above the very coldest obtainable, the phenomenon of second sound does not occur.

Indication of the very queer behavior of materials at the temperatures near absolute zero can be seen on this week's cover of the SCIENCE NEWS LETTER. A flask of liquid oxygen is placed between the two poles of a magnet. The liquid appears to defy the law of gravity; actually, it is attracted to the two magnetic poles, thus causing the U-shape.

The characteristics of helium below two degrees above absolute zero are so remarkable that scientists have given the element a special designation, helium II. This liquid behaves so unlike any other fluid known that it is often referred to as a fourth state of matter or as the quantum fluid.

This research with helium II is expected to result in a new method of producing extremely low temperatures. The atoms of the superfluid type of helium can be separated from the normal type of atom. This is done by passing the fluid through an opening less than 1/100,000 of an inch in diameter. Only the superfluid comes through, and it does so without taking any heat energy with it. Successive passages through the extremely fine opening would separate most of the superfluid, thus allowing lower and lower temperatures to be reached.

Science News Letter, February 18, 1950

ENGINEERING

Cold Rubber Is Superior To Natural in Tire Treads

➤ THE relatively new synthetic known as "cold rubber" is superior to natural rubber for tire treads, footwear and a great variety of mechanical goods, the American Chemical Society was recently told by Dr. W. B. Reynolds, Phillips Petroleum Company, Bartlesville, Okla.

Fifty-thousand-mile truck tires, 75,000-mile passenger car tires, and longer-wearing foam rubber furniture cushions are among a host of improved products promised by the development of cold rubber, he said. The use of synthetic rubber in tire carcasses is another matter. In large truck and bus tires it still is desirable to have at least 70% natural rubber in the carcass compounds.

Cold rubber is a synthetic similar to the standard kind known as GR-S, but it is produced at a temperature in the neighborhood of 32 degrees Fahrenheit, the freezing point of water. It is from this fact that it gets its name. It was first made commercially about two years ago. Production, however, had reached an annual rate of 150,000 long tons by the end of 1949.

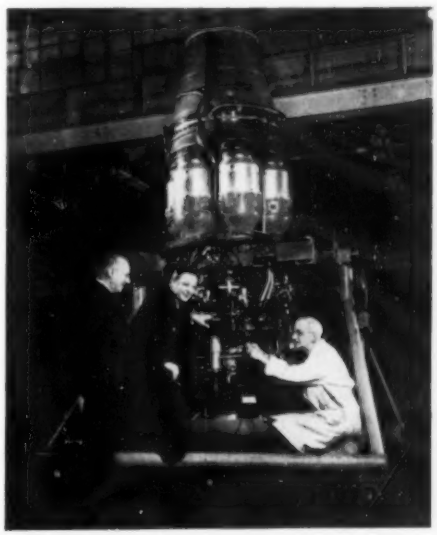
Some limitations of cold rubber are given by C. C. Davis, Boston Woven Hose and Rubber Company, Cambridge, Mass., in a report to the American Chemical Society's CHEMICAL AND ENGINEERING NEWS.

Although cold rubber is admittedly a big improvement over the standard synthetic known as GR-S, "no synthetic rubber has yet been developed which has such merit that it is acceptable in place of natural rubber for general use," he states.

"There is no prospect of a general shift from natural rubber to synthetic rubber in the near future," Mr. Davis declares. "Except in a few applications, such as the wire industry, natural rubber will remain the preferable material. Cold rubber, at present the most prominent of the synthetics, not only is inferior in some respects, but its price is higher than that of natural rubber."

Mr. Davis emphasizes, however, that cold rubber "is only the forerunner of synthetic rubbers so much superior in quality to natural rubber that the latter may ultimately become an unimportant item in the rubber industry—unless, of course, the rubber producers make corresponding improvements in natural rubber."

Science News Letter, February 18, 1950



TURBOJET ENGINE—The Orenda engine will power the Avro-CF-100 fighter, first all-weather, long-range aircraft of its type, which made its maiden flight recently. Sir Roy Dobson, President of Avro Canada, (center) inspects the engine at the Malton, Ontario plant while Walter N. Deisher (left) and Leslie Foster (right) watch.

MEDICINE

Chloromycetin Stems Whooping Cough Epidemic

➤ GOOD results with chloromycetin, one of the new mold remedies, have been obtained in fighting whooping cough during a severe epidemic of the disease in Bolivia. The death rate during this epidemic was twice as high as that from whooping cough in North America.

All the children who got the drug were free of fever on the second day after it was started and their coughing fits had greatly decreased. By the fourth or fifth day, the whoops were over.

Because of the limited supply of the drug and the large number of children with whooping cough, only those who were seriously ill got the drug. The good results in these seven children were reported to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Dec. 31, 1949) by Dr. Eugene H. Payne of Parke, Davis and Company, Detroit, where the drug is made, and the following Bolivian physicians: Drs. Miguel Levy, Gaston Moscoso Zamora, Moises Sejas Vilarroel and Edwardo Zabalaga Canelas, all of Cochabamba.

Science News Letter, February 18, 1950

ENGINEERING

Static Electricity Makes Drawings from Microfilm

➤ WORKING drawings of usable size, from microfilm copy, are being made at the Wright-Patterson Air Force Base in Dayton, Ohio, by a process which employs a charge of static electricity on a sensitive metal plate, it was revealed.

The process, now used for the past year or more, is known as Xerography, and is the invention of Chester A. Carlson, patent attorney of New York. Development work on the process of documentary reproduction was carried on cooperatively by Battelle Memorial Institute, Columbus, Ohio, and the Haloid Company of Rochester, N.Y.

The system uses a dry method of making a direct positive enlarged print in approximately one minute. No chemical solutions and no specially-treated paper are required. Unskilled persons can make good Xerography prints easily by following simple directions.

The metal plate used is coated with the non-metallic chemical element known as selenium. This accepts an image in much the same way as does a photographic plate. The Xerographic plate is sprayed with electrons emitted by the fine wires of a high voltage machine just before exposure in the camera or under the enlarger.

During exposure the electrons escape from the areas that receive light, but are retained on the dark areas. The surface of the exposed plate is dusted with a specially-prepared black developing powder. Electrostatic attraction causes the powder to adhere only to those portions of the plate where the electrons have remained.

Printing of this powder image is accomplished by placing a sheet of paper in contact with the powdered plate and then spraying the paper with electrons. The electric charge lifts powder particles from the plate and causes them to stick to the paper. The powder image on the paper is made permanent by a few seconds of heat-treatment. Made of resin and pigment, the powder is melted and fused to the paper by the heat.

Science News Letter, February 18, 1950

MEDICINE

X-rays Aid Injections For Neuralgia

➤ ALCOHOL injections into the nerve to kill the pain of trigeminal neuralgia, or tic douloureux, can be done with less pain and better results if X-rays are used to determine the position of the injecting needle, Dr. W. H. Sweet of Boston reports in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Feb. 11).

Patients with cancer of the face also are sometimes given these alcohol injections for relief of pain. The injections are made, according to Dr. Sweet's method, into the second and third divisions of the trigeminal nerve, also called trifacial and fifth cranial nerve.

Complete injections into the nerve were made in over 95% of those attempted when X-rays were used for guidance, Dr. Sweet reports.

Relief of pain in trigeminal neuralgia following the injections into the third division of the nerve lasted for at least 30 months.

Dr. Sweet states that he has heard of other physicians using X-rays in this manner but has not seen any published reports on it.

Science News Letter, February 18, 1950

MEDICINE

Cancer Cells Undergo Chemical Changes

➤ CHEMICAL changes in body cells when they become cancerous are reported by Dr. A. Clark Griffin and associates at Stanford University, Calif.

When rats are fed a diet containing a dye which produces cancer of the liver, there is an increase within the cell of the amount of a chemical, desoxyribonucleoprotein, which is important in the growth and organization of the cell. At the same time there is a decrease in the amount of vitamin B_2, or riboflavin.

These changes may in some cases, Dr. Griffin and associates believe, cause cancer cells to develop from normal cells.

Science News Letter, February 18, 1950

IN SCIEN

MATHEMATICS

Translations Give Science Peek Behind Iron Curtain

➤ PEEKING behind the iron curtain to discover new things that Russians are finding out about mathematics, American scientists are now being furnished with English translations of important Russian articles that have reached this country.

The American Mathematical Society in New York has begun to issue these translations, made under a grant from the Office of Naval Research. Scientific literature in the USSR is now written only in the Russian language, although up until 1947 most articles had English, French or German summaries.

Although mathematical notation is a universal language, the explanatory words are also important. The translations are found necessary to give access to important original work that the Soviet mathematicians are doing.

Science News Letter, February 18, 1950

ZOOLOGY

Cocktail for Oyster May Be Sugar or Starch Chemical

➤ THE cocktail for the oyster in your oyster cocktail has been discovered. It is a chemical, perhaps of the sugar and starch group, which occurs naturally in sea water.

It is what stimulates the oyster to start pumping its food out of the sea. When the amount of this chemical in the water falls below a certain level, the oyster does not pump. Above this level, the more there is of the chemical, the more the oyster pumps.

These findings, which seem to give the first clue to what makes oysters pump for food, were made by Albert Collier, Sammy Ray and Wayne Magnitzky in Pensacola, Fla. The facilities of the U. S. Fisheries Station were made available to them for this research which is reported in the journal, SCIENCE (Feb. 10).

When the temperature and saltiness of the water are at their optimum, the oyster will open for a short time which the scientists call the "testing period." If the oyster's cocktail chemical has reached a high enough concentration, the oyster will immediately start pumping. If the amount of the chemical in the water is not high enough, the oyster will immediately close.

This goes on for days at a time. The oyster may miss the period of high concentration of its hunger-chemical if it fails to open while this concentration is high.

Science News Letter, February 18, 1950

NE FIELDS

PHYSICS

First Step in Atomic Process in Sun Confirmed

➤ VERIFICATION has been obtained on earth of the first step in the famous atomic transmutations that keep the sun and stars stoked with energy.

While this new high-voltage research reported from the California Institute of Technology, Pasadena, Calif., is not directly concerned with the theory of the so-called hydrogen bomb, it is new evidence that the source of star energy is the interaction of carbon, nitrogen and hydrogen in the terrifically hot interiors of the stars.

Drs. Robert N. Hall and William A. Fowler of Caltech's Kellogg Radiation Laboratory, subjected ordinary carbon of mass 12 to bombardment with the hearts of hydrogen atoms, called protons. According to the theory of Dr. H. A. Bethe first put forth in 1938, gamma radiation (like X-rays) is given off and a new kind of carbon, mass 13, is formed. This is the first step in a cycle that results in helium being formed and the original kind of carbon being restored to the star. The energy results from the conversion of mass just as is the case in the atomic bomb.

Working with bombardment levels of about 100,000 electron volts, which is small compared with the higher values of giant accelerators, Drs. Hall and Fowler determined the nuclear reaction rates, which the scientists call "cross sections" of the atomic heart. Their results give a rate about 40 times that used by Dr. Bethe, now at Cornell, in his original theory. This means that the individual carbon atom in the center of the sun would live about 50,000 years instead of 2,500,000 years, as the original theory had it.

The important thing about the new experiments, reported in the PHYSICAL REVIEW (Jan. 15), is that they are generally consistent with the Bethe carbon-nitrogen cycle of stellar energy. This gives another bit of evidence as to how the energy of the universe is kept renewed. It is from such facts that atomic theory behind earthly developments, such as the possibility of new energy sources, is being discovered.

Science News Letter, February 18, 1950

MEDICINE

Anti-TB Drug Tried In Veterans Hospitals

➤ LATE in 1950 is the earliest date at which tuberculosis patients, in general, expect to get treatment with Tibione, German synthetic drug considered promising as an aid to streptomycin and PAS (para-aminosalicylic acid).

But some patients in 24 hospitals of the Veterans Administration, at the National Jewish Hospital, Denver, Grasslands Hospital, Valhalla, N.Y., and Ocean View Hospital, Staten Island, N.Y., may be getting the new drug now.

Trials of the drug's ability, also of its possible dangers and shortcomings, are now under way in these institutions, Dr. Charles E. Dutchess, medical director of Schenley Laboratories, Inc., told the American Drug Manufacturers Association meeting in Cleveland. Schenley is making the drug available for these studies, after a favorable report by two American TB specialists, Drs. H. Corwin Hinshaw of San Francisco and Walsh McDermott of New York. These two went to Germany last summer to see doctors, laboratories and patients about Tibione.

Science News Letter, February 18, 1950

DENTISTRY

Speedy Drilling Heats up Teeth

➤ GOT a hot tooth? You have when the dentist drills, especially if he works at high speed without pause. And the heat adds to the pain and discomfort of the drilling.

A 100-degree temperature rise, on the average, takes place when the burr goes through enamel, a 38-degree rise when it drills in the softer, underlying dentin of the teeth. Maximum temperature rise during tooth enamel drilling is 140 degrees.

Low speed, intermittent drilling, with small cutting tool sizes and light pressure applications will keep the temperature down, Dr. Floyd A. Peyton, University of Michigan professor of dentistry, suggests. He reported his temperature experiments at the Chicago Dental Society.

Science News Letter, February 18, 1950

NUCLEAR PHYSICS

Atomic Bomb Defense Studied by Service Groups

➤ DEFENSE against the effects of atomic bomb attack is the fundamental reason for the studies of two groups of officers of the armed services now taking special courses at two American universities.

Known as the "radiological defense group," a section of 10 men representing all the armed forces is at Ohio State University, Columbus, Ohio, and another section of 27 officers is at the University of California, Berkeley, Calif.

When studies are completed, these officers will serve as advisers to U. S. military commanders on the new and technical problems involved in defense against radioactive materials. Studies are mainly in the fields of nuclear physics, in the department of physics and astronomy, and in biophysics. A branch of medicine known as toxicology is also included.

Science News Letter, February 18, 1950

INVENTION

Process Preserves Eggs Without Shells

➤ EGGS in all their freshness are preserved, without shells, by a quick-freeze process under a method for which a government patent was issued recently. A special container used is included in the patent.

The container in which the eggs are frozen and kept until wanted for use resembles the ordinary ice cube tray of the home freezer, but is considerably smaller. It is made of paper or plastic, with the interiors of the compartments coated with wax. Each compartment holds one egg.

The contents of each shell is placed in its own compartment with its yolk unbroken. The white surrounds the yellow. Small openings between compartments permit the white to flow until the top surfaces are on a level. The filled trays are then put into the freezer.

Patent 2,496,755 was awarded to Louis Schwartzberg, Chicago, for this invention.

Science News Letter, February 18, 1950

CHEMISTRY

New Stainless Steel Has Desirable Properties

➤ A NEW stainless steel, containing chromium, nickel and copper, will broaden the stainless steel field of applications because it has a unique combination of desirable properties never before available.

These include excellent corrosion resistance, high strength and hardness, ease of fabrication and low-temperature hardenability. It was developed by the Armco Steel Corporation in Middletown, Ohio, and will be known as 17-7 PH stainless steel. It contains 17% chromium, 4% nickel and 4% copper.

It is recommended for use in the chemical, petroleum, textile and food producing industries for springs, pressure tanks, conveyor parts, washers and similar parts. Its high strength and corrosion resistance make it especially suitable for many applications in the aircraft and automobile industries. Other suggested uses are in carpenters' handsaws, bandsaws, measuring tapes, corset stays and fishing rods.

A form of this new stainless steel, available in soft temper strip, sheet and plate, can be easily fabricated by standard procedures, and then brought to full strength and hardness by heat-treatment.

The process involves heating at 1,400 degrees Fahrenheit for 30 minutes, air cooling and re-heating to about 900 degrees. The hardening process is not only simple and economical but cracking, distortion and decarburization, encountered in conventional heat treating, are virtually eliminated.

Science News Letter, February 18, 1950

METEOROLOGY

Next Month's Weather

Meteorologists now predict the weather 30 days in advance. Weather data from all parts of the world aid the analysis of hemispheric movements of wind currents.

By WADSWORTH LIKELY

➤ IN man's never-ending war with the weather, he has always wanted to know what next month's or next season's weather will be.

In times past, men looked for signs in the clouds or even depended on their aching corns. For long-range forecasts of a coming winter, Indians examined the barks of trees.

Only recently has the weatherman been able to say with some assurance what the elements might have in store at some period in the future.

Monthly Predictions

The United States Weather Bureau is now publishing bulletins which predict what the weather will be like for a month in advance.

For instance, in mid-January, the Extended Forecast Section of the Weather Bureau said that, until mid-February, temperatures would be near normal east of the Appalachians, in the southeast and in central California. They were supposed to be below normal in a semi-circular arc running from the Great Lakes down through the midwest and out toward the California-Oregon border, and much below normal in North Dakota, Montana, Idaho and Washington.

However, Jerome Namias, chief long-range forecaster, warns that the temperatures in one particular city are no indication of the accuracy of his long-range predictions. He is talking about whether it will be warm or cool, whether it will rain or be dry, over a large region.

Good Results Claimed

He claims, and the results back him up, that his section's monthly forecasts are consistently better than purely statistical forecasts.

If you want to see the Weather Bureau's considered opinion of what the weather will be like a month in advance, you can subscribe to its "Average Monthly Weather Résumé and Outlook" for $4.80 per year. The monthly bulletin is not yet generally published because, the Weather Bureau feels, it still is subject to misinterpretation by the layman.

Extended weather forecasts are still relatively new. The monthly bulletins have only been published since July, 1948, and the Weather Bureau has been experimenting on long-range predicting only since 1942.

Useful to Industry

Now, Mr. Namias feels, the monthly extended forecasts, if properly used and when their limitations are realized, can be of great use to industry, agriculture, hydrologists, coal dealers and the like.

Ability to predict the weather a month ahead of time with any reasonable expectation of being right required what amounted to a revolution in the science of meteorology. The revolution began in 1936 at the Massachusetts Institute of Technology.

There, the Swedish meteorologist, Dr. Carl Gustav Rossby, working with Weather Bureau and Agriculture Department experts, launched a theoretical study of weather based on new concepts of why it gets hot and cold, why it rains and snows.

Before Dr. Rossby, weather men had amassed vast amounts of statistics. They had an idea that weather in one place was related to weather in another place and they spent years trying to connect up temperatures in Minneapolis, say, with temperatures in New York. This vast and painstaking effort produced very little.

It was Dr. Rossby's idea that to know what the weather would be in one place, you had to know what the whole weather picture all over the northern hemisphere, and even the world, had been for the past few months. And you had to look at it as one complete picture, not as bits of isolated temperature and precipitation statistics.

It was already known that the wind current moves from west to east in the northern hemisphere. However, the speed with which it moves varies from very slow to 200 miles an hour. And this vast river of weather has a north to south movement as well—long waves covering hundreds of miles.

This current, its speed and its latitudinal movements, are nature's tool for siphoning off heat from the equator and cold from the poles. And in the process, we get our weather.

Analyze Current

Dr. Rossby believed that if meteorologists could analyze the vast, hemispheric movements of this current, if they could detect trends in those movements, they might be able to predict the weather far in advance.

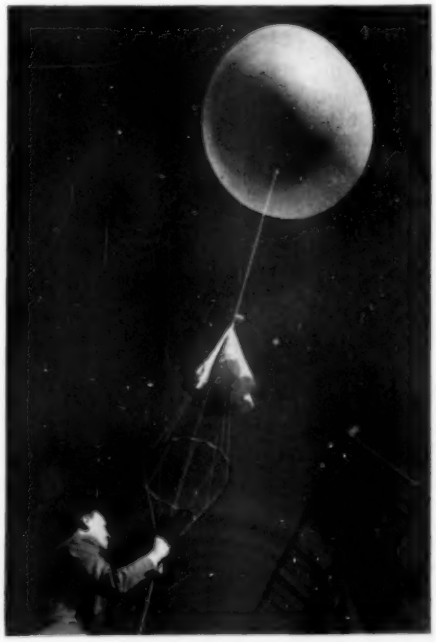
Mr. Namias was one of Dr. Rossby's students at M.I.T. Now he heads the Bureau's Extended Forecast Section, and, monthly, he is proving that his teacher was right.

To get the vast picture which Dr. Rossby said was needed, Mr. Namias needs weather data from all over the northern hemisphere. Several times a day, the Bureau receives from weather stations in Europe, in Soviet Russia and Siberia, reports of temperature and precipitation and reports of how the weather is up to 30,000 feet above the earth. United Nations politicians might well take a leaf from the international weatherman's book.

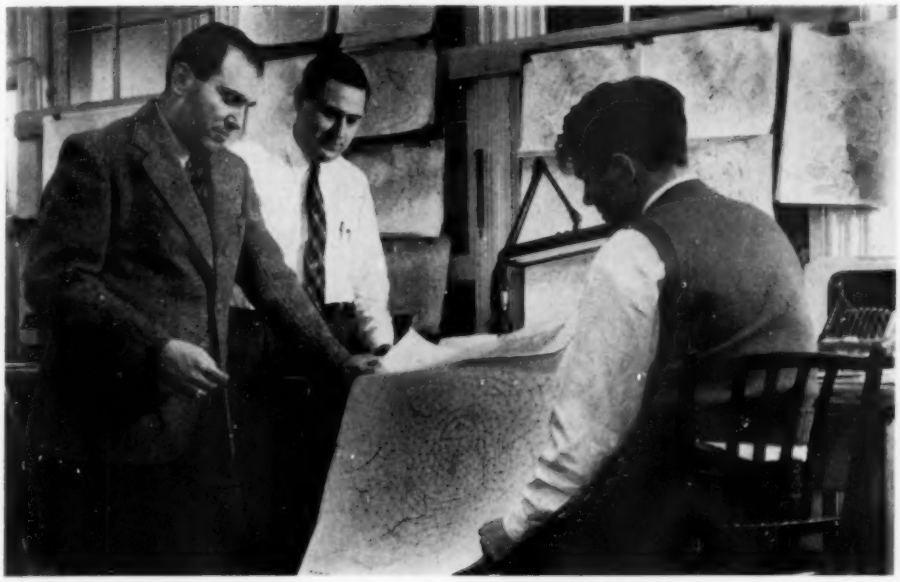
High Altitudes

Mr. Namias doesn't particularly like observations taken much below 10,000 feet. Near the earth, there are too many local variations. By sending up balloons and planes the weathermen are able to get the broad sweep of the wind current which they need to make their predictions.

Mr. Namias emphasizes that there is still a long way to go in meteorology. Why does this current sweep around the earth from west to east? What do sunspots and other changes in the sun have to do with the weather? Some scientists say that all weather is a product of the sun and to



BALLOONS ALOFT—All over the northern hemisphere balloons such as above are being sent aloft—as high as 30,000 feet—to gather data from which weathermen make their long range forecasts.



CHARTED CURRENTS—Jerome Namias, Chief of the Extended Forecast Section, United States Weather Bureau (left), looks over a chart of the northern hemisphere upon which the path and speed of the great weather currents have been indicated. Weather forecasts a month in advance are made from these charts.

predict the weather accurately, you have to predict what the sun is going to do.

Now, in many centers of learning throughout the world, men are trying to find out, not whether it is going to rain tomorrow, but whether it is going to rain on this day next year.

Science News Letter, February 18, 1950

ZOOLOGY

Gray Whales in Pacific Are Increasing

➤ THE Pacific gray whales are on the increase again. As many as 30 a day have been seen in the coastal shallows as they head for their winter mating grounds.

Dr. Carl L. Hubbs, marine biologist at the Scripps Institution of Oceanography, La Jolla, Calif., has been observing the whale's comings and goings for several years. He reports that the whales are coming back in larger numbers now that they are protected by an international whaling agreement. At one time they seemed headed for extinction.

The Pacific gray whale spends the summer in the Bering sea and then migrates to the waters off the coast of lower California where it remains till March.

Science News Letter, February 18, 1950

AGRICULTURE

Herbicide Kills Weeds, Allows Cotton to Grow

➤ A WEED killer that kills off the competition but allows the cotton to flourish has shown great promise in tests made at the University of California College of Agriculture in Davis, Calif.

The herbicide that shows this commercially valuable ability to select between desirable and undesirable plants is called maleic hydrazide. It is a growth-regulating compound.

Drs. H. B. Currier and A. S. Crafts of the botany division found that maleic hydrazide has a rapid lethal effect on barley, which is a grass, but has no noticeable effect on cotton plants. Immediately after spraying, barley stops growing, leaves turn dark green and die, and in about six weeks the entire plant is dead. Cotton plants sprayed with the compound, on the other hand, continue to grow and to flower at exactly the same rate as unsprayed plants.

The two botanists have found that the age of the sprayed plants makes a difference. Even cotton, if it is sprayed too young, will be affected.

This fact is helpful in control of weeds, because if the cotton is allowed to develop, the weed killer can be sprayed as soon as the weed grasses start to appear. Experiments with water grass and Johnson grass have been successful, the young grass shoots being killed off by the spray.

A more thorough testing of the chemical is being planned. Of particular interest to the investigators is the chemical's selectivity. This is a valuable and useful property in agricultural practice.

Drs. Currier and Crafts announced their preliminary findings in the journal, SCIENCE (Feb. 10).

Science News Letter, February 18, 1950

CORTINAPHONE Makes It EASY To:

Speak FRENCH-SPANISH GERMAN—ITALIAN

COUNT CORTINA

BIG OPPORTUNITIES await Americans who speak languages. Learn as a child learns—"by listening" to these CORTINA recordings. The CORTINAPHONE METHOD, famous for 65 years, teaches you right at home to speak FRENCH, SPANISH, GERMAN, or ITALIAN as a NATIVE speaks!

Listen to this Record!

VETS

FRENCH or SPANISH course available under G. I. Bill if Veteran

Sent on 5 Days' Approval

Write today for free book which describes the amazing "Cortina Short-Cut" Method. State language interested in.

FREE CORTINA ACADEMY BOOK Dept. 602B, 105 W. 40 Street, N.Y.C.

Get the real story!

READ

GIANT BRAINS

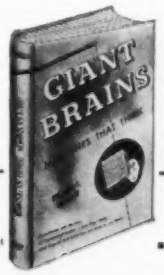
or Machines That Think

By EDMUND C. BERKELEY

Giant Brains tells how a machine will and will not think . . . gives an introduction to punch card machinery . . . describes the first three big "digital" calculators . . . lists some problems we can expect machines to solve . . . and suggests how we may hope to guide the robot machine.

"Giant Brains presents exciting achievements and possibilities. The book as a whole is easy to read. It should make an ideal companion volume to Norbert Wiener's much discussed *Cybernetics."* —*N. Y. Times*

November 1949, 270 pages, illus., $4.00



EXAMINE BOOK FOR 10 DAYS ON APPROVAL COUPON

JOHN WILEY & SONS, INC.
440 Fourth Ave., New York 16, N. Y.

Please send me, on 10 days' approval, a copy of Berkeley's GIANT BRAINS. If I decide to keep the book I will remit $4.00 plus postage; otherwise I will return the book postpaid.

Name _____

Address _____

City _____ Zone ___ State ___

(Offer not valid outside U.S.) SNL-2-50

RADIO

FM Facsimile Transmission

➤ FM radio broadcasting stations now bringing static-free "voice" programs into homes may be easily adapted also to bring printed pages by facsimile transmission, the American Institute of Electrical Engineers was told by John V. L. Hogan, Hogan Laboratories, New York, N. Y.

The cost of adding a multiplex facsimile channel to an FM (Frequency-Modulation) sound station is relatively small, he stated. The multiplex makes it possible to operate two simultaneous services without mutual interference.

Facsimile transmission is a method of delivering a printed page, map, illustration or other matter from station to receiver by air or wire. The transmitted signals are much like those sent in television but in the receiver they cause a permanent record by the use of photographically sensitive paper or by an electric stylus on a special paper.

"Facsimile is just beginning to go into general use," Mr. Hogan said. "More or less like television, the broadcasting of facsimile will first be directed to receiving sets and display recorders located in public places, such as hotel lobbies, airport terminals and theater lobbies.

"As regular programs become available on a broadcast basis it is expected that home receiving sets with facsimile recorder, or facsimile recorders for attachment to standard FM sound receivers, will get into production. The inevitable consequence of quantity manufacture is to bring down cost, and thus facsimile receivers are expected to become available at such reasonable prices that they can be purchased and used by the average home owner."

This means that the publication and delivery of a newspaper to the public by radio should become an accomplished fact.

Science News Letter, February 18, 1950

MEDICINE

How To Survive Arctic Cold

➤ A WAY to keep alive longer under cold conditions, with potential importance in the event of an Arctic war, has been discovered by a team of Army and civilian researchers at Fort Knox, Ky., and New York City.

Doses of thyroid extract would be the method, these researches show.

Survival time was increased 54% by the proper dosage of a thyroid compound, called endothyrin, given to a group of experimental animals. Not only were the animals able to survive the cold longer, but more of them survived.

When the activity of the thyroid gland was suppressed by doses of another chemical, thiouracil, more animals died and died sooner on exposure to the cold.

The thyroid dosage had to be carefully regulated, to avoid causing thyrotoxicosis, a dangerous condition of poisoning from too much thyroid material in the body. A dose that raised the basal metabolic rate by 30% to 50% was found correct for the animals.

Chief practical drawback to the use of thyroid for men potentially threatened with prolonged exposure to cold is a time lag. When the thyroid extract doses were given by mouth it took four or five days to produce the cold-resisting effect. Men able to survive that long would probably survive without the aid of the medicine. Given by injection, the thyroid compound took effect within eight hours, but in a military situation medicine that can be given by mouth is preferred.

The studies, revealed in the first issue of the new U.S. Armed Forces Medical Journal in Washington, D.C. were carried out partly by Dr. Curt Lange of New York and by researchers under the direction of Col. Fred Knoblock at Fort Knox, under the auspices of the Army Medical Research and Development Board.

Science News Letter, February 18, 1950

√CHECK LIST

Cargille Products for Chemists

TRANSPARENT PLASTIC BOXES:

For keeping samples, specimens and small parts in order, completely visible. 5 sizes_____201

BOILING STONES:

Effective anti-bumping agent for overheated liquids. Speeds distillations, yields sharper fractions. Sample on request _____202

VISCOSITY TUBES:

Matched for the Air-Bubble Method of comparing viscosities. Widely used in the Varnish Industry_____203

Just Specify Code Number

R. P. CARGILLE

118 Liberty St. New York 6, N. Y.

ENTOMOLOGY

New Spray for Fruit Tree Mite Available Next Month

➤ WHEN the government resumed hearings Feb. 13 on the quantities of poisonous insecticides that may remain on fruit and vegetables at marketing, one more chemical had been added to the list to consider.

The new chemical, an organic phosphorous compound called EPN, is intended principally for use against mites. Mites are tiny pests that do millions of dollars worth of damage each year to the country's fruit trees. EPN is very short for ethyl p-nitrophenyl thionobenzenephosphonate.

The Food and Drug Administration tolerance hearings received an unexpected two-and-a-half week recess because the Department of Agriculture, the lead-off witness, completed testimony 15 days ahead of schedule. Sessions were resumed Monday, Feb. 13.

EPN has been undergoing extensive tests, but has not been available to the general public. The Du Pont Company, makers of the compound, have just announced that they expect it to be available for spring spraying by March 1.

The U.S. Department of Agriculture has not completed its own tests of the new mite-killer. For that reason EPN is not yet included on the Department's list of recommended insecticides.

Science News Letter, February 18, 1950

MINING

Dr. F. G. Cottrell, Biography in Preparation

➤ THE biography of the late Dr. Frederick Gardener Cottrell, founder of the Research Corporation, New York, former director of the United States Bureau of Mines and the Fixed Nitrogen Research Laboratory is being compiled by Frank T. Cameron, 240 Glen Drive, Sausalito, Calif. who would appreciate letters, informal anecdotes, personal impressions or information regarding any phases of Dr. Cottrell's scientific work.

Science News Letter, February 18, 1950

ENGINEERING

Car Life Expectancy Doubled in 25 Years

➤ THE family car of today has a probable life of 12 years of service. It will have 103,000 miles behind it before it reaches the junk yard.

These auto life expectancy figures have been compiled by W. L. Aiken, automotive engineer at SKF Industries, Philadelphia, Pa.

In 1925 the average auto had an average life span of about six years and 25,750 miles. The car of 1935 had a life expectancy of over eight years and a probable 58,000 miles.

Cars last longer now because:

Metals are lighter, stronger and more durable, due to alloys.

Engines are better balanced because the sizes and weights of parts within assemblies are precision matched.

Wear is substantially reduced by anti-friction bearings that keep moving parts in better alignment."

Science News Letter, February 18, 1950

WAR SURPLUS OPTICAL BARGAINS

ASSEMBLE YOUR OWN BINOCULARS

Complete Optics!

Complete Metal Parts

SAVE More Than ½ Regular Cost

GOVERNMENT'S 7 x 50 BINOCULARS

(American Made—not Japanese)

Here's an unusual opportunity to secure a fine set of Binoculars at a substantial saving of money. Offered here are complete sets of Optics and Metal parts for the 7 x 50 Binoculars. These components are new and all ready for assembly. Full instructions supplied. **METAL PARTS**—Set includes all Metal Parts—completely finished—for assembly of 7 x 50 Binoculars. No machining required. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.

Stock No. 842-Q.....$39.40 Postpaid
plus $4.80 for Case.....Total $44.20

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 x 50 Binoculars. These optics are in excellent condition—perfect or near perfect and have new low reflection coating.

Stock No. 5102-Q—7x50 Optics—**$25.00 Pstpd.**

NOTICE: Add 20% Federal Excise Tax to your remittance if you buy both Binocular Optics and Metal Parts.

ARMY'S 6 x 30 BINOCULARS

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars (Waterproof Model). Everything you need—ready for assembly. When finished will look like a regular factory job costing $102 to $120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal parts are new and perfect, all completely finished. No machining required. Complete assembly instructions included.

Stock No. 830-Q.....$40.00 Postpaid
plus $8.00 tax.....Total $48.00

OPTICS AND METAL PARTS are available for Monoculars (½ a Binocular). For complete details, write for Bulletin Q.

$1200.00 VALUE for $95.00

SCISSORS TELESCOPE—Gives 100 times greater stereoscopic power than the unaided eye. Binocular type. Big field of view. 12 power. Furnished complete with tripod mount and case. Used by Army and Navy for long distance spotting, target observation, etc. Used but good condition. Shipped f.o.b. Camden, N. J. (Weight approx. 79 lbs.).

Stock #952-Q.....$95.00

MOUNTED TELESCOPE EYE-PIECE—Kellner type. Excellent astronomical and other telescopes. War Surplus. Government cost about $18.00. Focal length 24 mms. Lens Diameter 23 mms. Unusually wide field.

Stock No. 5189-Q.....Price $3.25 Postpaid

THICK FIRST SURFACE MIRROR—Aluminized and hard coated. May be cleaned without scratching surface. Optically flat to ¼ wave. Size 3-13/16" x 3-3/16" . . . 9/16" thick. Excellent substitute for large Right Angle Prism.

Stock #562-Q .....$3.00 Postpaid

SEE COLOR TELEVISION NOW! TODAY! . . . for only $1.00

See your Black and White image in vivid colors. Your optical "convertor" is one of our Plain Tank Prisms. Simply hold it up to your eyes and look through the prism. Your television image will take on brilliant hues of red, orange, yellow, blue, green, indigo, violet. A beautiful sight! Practical? Not for steady use, but definitely a unique and novel effect. These prisms are war surplus . . . sold at a fraction of their original cost.

Stock #3101-Q—Plain Tank Prism
(Seconds—Slightly chipped).....$1.00 Postpaid
Stock #3005-Q—Plain Tank Prism
(First Class) .....$2.00 Postpaid

8 POWER ELBOW TELESCOPE

Gov't Cost $200.00
Our Price $27.50

Big. 2 in. diameter objective. All lenses Achromatic. Amici-prism erects the image. Four built-in filters—clear, amber, neutral and red. Slightly used condition but all guaranteed for perfect working order. Weight 5 lbs. Can be carried but a trifle bulky. Excellent for finder on Astronomical Telescope.

Stock No. 943-Q.....$27.50 Postpaid

LOW POWER RIFLESCOPES and ACHROMATIC LENSES to make your own higher power Riflescope (2½ to 7½ power or over). Write for Bulletin "Q".

TELESCOPE EYE-PIECE—Consists of 2 Achromatic lenses F.L. 28mm, in a metal mount.

Stock No. 5140-Q.....$4.50 Postpaid

MAKE YOUR OWN ENLARGER

MOUNTED ANASTIGMAT LENSES

Use for Projectors, Enlargers, Copying Cameras. Complete with Shutter and Diaphragm. Value about $20. These were made for a specific camera but had longer or shorter focal length than could be used, and then the camera was discontinued. An excellent buy. **WE WILL INCLUDE FREE ILLUSTRATED BOOKLET on HOW TO MAKE YOUR OWN ENLARGER.**

Stock No. 8004-Q Speed f/7.7, focal length approx. 127 mms. Suitable for pictures, negatives, positives up to 3½ x 4¼" ..... **$7.50 Postpaid**

Stock No. 8006-Q Speed of f/7.7, focal length approx. 100 mms. Suitable for pictures, etc. up to 2¼ x 3¼", **$8.50 Postpaid**

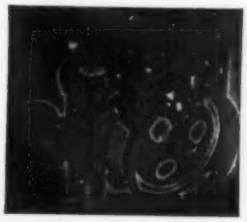
CONDENSING LENSES—Seconds, but suitable for Enlargers and Spotlights.

Stock #1103-Q—29/32" dia. ½" F.L. **$ .50 ea. Pstpd.**
Stock #1086-Q—1-11/16" dia. 3" F.L. **$ .25 ea. Pstpd.**
Stock #1077-Q—2⅜"dia. 3" F.L. **$1.00 ea. Pstpd.**
Stock #1084-Q—2½"dia. 4" F.L. **$1.00 ea. Pstpd.**
Stock #1099-Q—4-7/16"dia. 6½" F.L. **$1.20 ea. Pstpd.**
Stock #1080-Q—5" dia. 7" F.L. **$1.00 ea. Pstpd.**
Stock #1019-Q—6"dia. 16" F.L. **$2.00 ea Pstpd.**
Stock #1061-Q—6½"dia. 9" F.L. **$2.50 ea Pstpd.**

MOUNTED PROJECTION LENS—Speed F/1.9 . . . F.L. 15 mm. $22.00 value for $7.50. Low Reflection Coated. Used on 8 or 16 mm. Movie Projectors . . . or to make a Desk Viewer or Editor . . . for 16 mm. Micro-film Reader . . . for Contour Projector for very small items.

Stock #4045-Q ..... $7.50 Postpaid

UNUSUAL BARGAIN BUBBLE SEXTANTS



These Army Air Forces Bubble Sextants costs the Govt. about $125.00 each. A real bargain at our price at $12.50! Wooden carrying case included. Also auxiliary items. Wartime used. **BUT COMPLETELY REPAIRED COLLIMATED AND PUT IN GOOD WORKING ORDER.** If not satisfied that Sextant is exactly as represented, return within 10 days for refund. Full directions for use accompany each shipment.

Stock No. 924-Q..... $12.50 Postpaid

Stock #953-Q Same Sextant as above but only fair condition and not in good working order.

Sold as is.....$5.75 Postpaid

Stock #954-Q Same Sextant as above but poor condition. No carrying case or accessories.

Sold as is .....$2.50 Postpaid

Same sextant as 924-Q, but **BRAND NEW** and with Automatic Electric Averaging Device and Illuminated Averaging Disc for nighttime use. Govt. cost $217. Though brand new we have rechecked Bubble and Collimation and **GUARANTEE** perfect working order.

Stock No. 933-Q.....$22.50 Postpaid

BUBBLE SEXTANT—TYPE A-8A. Excellent condition but may be slightly used. Each has been carefully checked and collimated. Averaging device for nighttime use. Carrying Case and instruction booklet included. Gov't cost about $325.00. Attention! Boat owners! This sextant can also be used to view the natural horizon.

Stock #946-Q ..... $32.50 Postpaid

LOOK! LOOK! LOOK!

Sheet Polarizing Material—
Stock #691-Q Pr. of 1" dia. Circles 20c Pstpd.
Stock #692-Q Pr. of 2" dia. Circles 35c Pstpd.

SIMPLE LENS KITS

THE LENS CRAFTERS DELIGHT! Fun for adults! Fun for children! Kits include plainly written, illustrated booklet showing how you can build lots of optical items.

Stock #2-Q—10 lenses .....$ 1.00 Postpaid
Stock #5-Q—45 lenses .....$ 5.00 Postpaid
Stock #10-Q—80 lenses .....$10.00 Postpaid

LENS CLEANING TISSUE—1st quality sheet size 11 x 7½ in. Made to Govt. specifications. High wet strength. Free of abrasives.

Stock No. 721-Q—500 sheets..$1.00 Postpaid

SLIDE PROJECTOR SETS—Consist of all unmounted lenses you need to make the following size projectors:

Stock No. 4038-Q—2¼x2¼ in., $3.35 Postpaid
Stock No. 4039-Q—2½x3½ in., $3.85 Postpaid
Stock No. 4035-Q—35mm.....$4.85 Postpaid

NEW 50-PAGE IDEA BOOK "FUN WITH CHIPPED EDGE LENSES"

Contains wide variety of projects and fully covers the fascinating uses of all lenses in sets listed above.....only **$1.00 Postpaid**

MOUNTED PROJECTING LENS SYSTEM—F.L. 91.44 mm (just right for 35-mm Projectors). Speed of F 1.9. Outside dia. of mount at one end 60mm. Length of mount 64mm.

Stock No. 4033-Q,
$3.00 Postpaid

IF YOU'RE INTERESTED IN OPTICAL BARGAINS

Write for FREE CATALOG Q

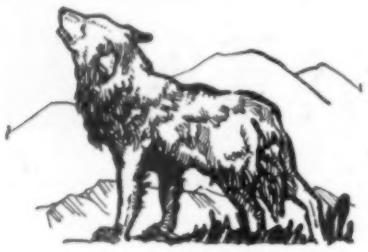
We Have Literally Millions of War Surplus Lenses and Prisms for Sale at Bargain Prices. Numerous Types of Instruments Too!

ORDER BY SET OR STOCK NO.

EDMUND SALVAGE COMPANY · BARRINGTON, NEW JERSEY

WILDLIFE

NATURE RAMBLINGS



Wolves

➤ ACCORDING to ancient legend, a pair of infant twin boys were thrown into the river. A she-wolf rescued the pair, nursed them, and raised them to young manhood. One of the boys founded a city which survives to this day.

The boys were Romulus and Remus. And the city was Rome.

According to another fable, a little girl wearing a red cloak traveled through the woods to see her grandmother. When she arrived, she found not grandma but a wolf dressed in grandma's cap.

The little girl, of course, was Little Red Ridinghood.

Of the two sides of the wolf's nature which are contrasted so sharply in these old stories, most people would say the second contained the truth of the matter.

However, the Romulus-Remus story, preposterous though it be in reality, has its adherents, even today. Some biologists who have observed wolves closely are of the opinion that the domestic life of a wolf is a shining example of love, kindliness and consideration.

Wolf marriages are believed to last a lifetime, and the solicitude shown the young by both parents is supposed to be of the tenderest. When the pups are young and sportive, and their horse-play overflows into the vicinity of papa wolf, he does not send them sprawling with a snarling backhand blow. Instead, he patiently gets up and moves out of the arena of juvenile rambunctiousness.

This sort of paternal care and thoughtfulness, which extends into the areas of feeding and training the young how to hunt, is a far cry from such philanthropies as rescuing human young from rivers and tending to their every need till the human can fend for himself.

But the two myths, with their contradictory views of this wild relative of the dog, do serve to underscore a controversy about wolves that persists to this day.

Although in great stretches of the United States wolves have been all but exterminated, in the timbered expanses of Canada and Alaska, they survive in considerable numbers. Since they are predators who live by killing wild game (or domestic stock where they can) the northern wolf population exacts a constant toll of mountain-sheep, moose, caribou, and other animals.

The controversy is between one group of conservationists who believe that man must go in and kill the wolves with planes, poisons, guns, and traps to save the game from extinction. The other group maintain that wolves exercise a weeding-out effect, killing the stragglers, leaving the most fit. It is the age-old disagreement, with a new bitterness. Romulus and Ridinghood can't both be right.

Science News Letter, February 18, 1950

IF YOU NEED MINERALS OR ROCKS
FOR YOURSELF OR SCHOOL
DON'T PASS THIS UP

We have individual specimens, reasonably priced, and complete Mineral collections from 50 boxed ores at $4.00 to museum collections of 550—3 x 4" superb specimens for $2.00. If you are looking for any mineral to complete a set or a series consult us. We have many scarce items, books on GEOLOGY or Mineral Charts.

Send for Large Free Catalogue

ECKERT MINERAL RESEARCH
(Dept SNL)
110 EAST MAIN STREET
FLORENCE, COLORADO

THE WORLD AS I SEE IT
by ALBERT EINSTEIN

NO OTHER BOOK either by him or about him is so complete a key to the understanding of this distinguished man's personality. These charming, witty, shrewd and intimate observations reveal Einstein's great heart and mind. "Recommended."—*Book-of-the-Month Club.* $2.75

At Your Bookstore, or Use Order Coupon

PHILOSOPHICAL LIBRARY, *Publishers*
15 E. 40th St., Dept. 35, N. Y. 16, N. Y.

Please send me_____copy(ies) of The World As I See It @ $2.75 per copy.

Enclosed are $_____

NAME_____

ADDRESS_____

(Expedite shipment by prepaying.)

MEDICINE

Clue to Heart Disease Found in Body Build

➤ THE man who is a mesomorph is the type most prone to heart disease. Least likely to have an attack of coronary heart disease is the ectomorph.

A mesomorph is of medium stature with broad and bulky limbs and features. Ectomorphic persons are the linear, or bean pole, type.

The finding that mesomorphs are more prone to heart diseases such as coronary thrombosis comes from a three-year research project at the Massachusetts General Hospital in Boston, under the direction of Dr. Menard Gertler assisted by Dr. Stanley Garn.

Though wider, shorter and with a larger chest diameter than the normal group, the coronary heart patients were no more overweight than the control group of patients without coronary disease.

Fatness, the scientists therefore concluded, is not an important factor in the cause of heart disease.

The heart group also differed from the normal in having a high content of cholesterol (a fat-like substance) and uric acid in the blood serum. An inter-relationship of these and other chemicals in the blood serum, rather than any specific chemical, is believed by the scientists to be eventually responsible for coronary heart disease.

Underfunctioning of adrenal and thyroid glands was found in many of the heart disease patients.

Science News Letter, February 18, 1950

ENGINEERING

Electronic Computers Aid Better Use of Water

➤ ELECTRONIC computers will tell us some of the answers needed for better use of our water supply, Dr. Arthur T. Ippen predicted.

These answers will be available for use while the water such as a flood crest is still flowing, not days or weeks afterwards as would be the case if conventional methods were used.

Under a special grant from the Research Corporation of New York, Dr. Ippen and Henry M. Paynter, Jr., of Massachusetts Institute of Technology, are finding instant answers to many problems of flowing water.

They can determine, for instance, the rise in a river below a reservoir when a flood crest enters the reservoir from above. This calculation requires taking into account the size and shape of the reservoir and its outlet as well as the amount of water in the crest. Such a detailed study can not be made quickly enough by conventional methods.

Science News Letter, February 18, 1950

• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publications direct from issuing organizations.

AERONAUTICAL ENGINEERING, SECTION II: Selected Bibliography of Engineering Subjects—Committee on Professional Training—*Engineers' Council for Professional Development,* 10 p., paper, 25 cents.

ANIMAL IQ: The Human Side of Animals—Vance Packard—*Dial,* 192 p., illus., $2.50. Conclusions by leading psychologists about the intelligence and personalities of many of the animals we see or read about every day. Actual photographs of birds, beasts, reptiles and fish—deep in concentration, as they go through their mental paces.

ANNOTATED DISTRIBUTIONAL LIST OF THE FERNS AND FLOWERING PLANTS OF SAN DIEGO COUNTY, CALIFORNIA—Ethel Bailey Higgins—*San Diego Society of Natural History,* 174 p., illus., paper, $1.25.

BEING A GOOD PARENT—James L. Hymes, Jr.—*Bureau of Publications, Teachers College, Columbia University,* 52 p., illus., paper, 60 cents. Problems of parents are discussed. One of the Parent-Teacher series.

BIOLOGIE DER GOETHEZEIT—Adolf Meyer-Abich, Ed.—*Chronica Botanica,* 302 p., $5.50. A classic treatment of the main problems of biology by Goethe and the naturalists of his time, including a passage on Goethe's principle of compensation and its significance. In German.

CIVIL ENGINEERING, SECTION III: Selected Bibliography of Engineering Subjects—Committee on Professional Training—*Engineers' Council for Professional Development,* 9 p., paper, 25 cents.

COUNSELING THE INDIVIDUAL STUDENT—John W. M. Rothney and Bert A. Roens—*Sloane,* 364 p., illus., $3.75. Attention is focused on the first step in counseling—the study of the individual student. For those who are preparing to become teachers and counselors at secondary and higher levels.

FLORA OF GUATEMALA—Paul C. Standley and Julian A. Steyermark—*Chicago Natural History Museum,* Publ. 642, 440 p., paper, $3.50.

FREE AND INEXPENSIVE TEACHING AIDS FOR THE SCIENCE TEACHER—Muriel Beuschlein and James M. Sanders—*Chicago Schools Journal,* Vol. XXXI, No. 2, 32 p., paper, free upon request to publisher, 6800 Stewart Avenue, Chicago, Ill. A list of scientific instructional materials for high schools.

AN INTRODUCTION TO THE STUDY OF EXPERIMENTAL MEDICINE—Claude Bernard—*Schuman,* 226 p., $3.00. First published in 1865, this book, a re-issue, has become a classic of the philosophy of science. Translated by Henry Copley Greene.

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY, Vol. I, No. 1—Malcolm Rigby, Ed.—*American Meteorological Society,* 78 p., paper, $3.00 per year, single copies 50 cents. Current abstracts in English on important meteorological literature in every language with cumulative, annotated bibliographies.

NATURE IN THE SAN DIEGO REGION—*San Diego Society of Natural History,* 30 p., illus., paper, 25 cents. A pictorial and descriptive presentation of the varied natural life of this area.

NUTRITION AND RESISTANCE TO CLIMATIC STRESS: With Particular Reference to Man—H. H. Mitchell and Marjorie Edman—*Quartermaster Food and Container Institute for the Armed Forces,* 112 p., paper, free upon request to publisher, Office of the Quartermaster General, Chicago 9, Ill. (Limited supply only.) More than 700 references are cited in the bibliography.

PLANE TRIGONOMETRY: with tables—H. M. Dadourian—*Addison-Wesley,* 193 p., illus., $3.00. A beginning textbook with answers.

PETROLEUM REFINING: Quarterly of the Colorado School of Mines—Harry M. Crain, Ed.—*Colorado School of Mines,* Vol. 45, No. 2A, 162 p., illus., paper, $2.00. Papers delivered at the Conference on Petroleum Refining Sept. 30 and Oct. 1, 1949. Seventy-fifth anniversary volume.

THE POPULATION UPSURGE IN THE UNITED STATES—Joseph S. Davis—*Food Research Institute, Stanford University,* 92 p., illus., paper, $1.00. A short study of population problems. Number 12 of the War-Peace Pamphlets.

PRACTICAL REPORT WRITING—Selby S. Santmyers—*International,* 118 p., illus., $2.75. How to plan and outline ideas for a smooth running report.

PSYCHICAL PHYSICS: A Scientific Analysis of Dowsing, Radiesthesia and Kindred Divining Phenomena—S. W. Tromp—*Elsevier,* 534 p., illus., $8.00. Presented as "an analysis of the influence of electromagnetic fields on psychic phenomena in human beings, with particular reference to divining phenomena," this will be useful as a record, but many will find it uncritical to say the least. The author is a professor of geology in Cairo, Egypt.

THE SCHOOL BOARD MEMBER IN ACTION—*American Association of School Administrators,* and *National School Boards Association,* 20 p., illus., paper, 25 cents. An outline of responsibility and relationship between school board members and school superintendents, teachers, pupils, and communities.

U. S. GOVERNMENT JOBS: The Why, What, Who, When, Where, and How of Federal Civil Service—Carl Scott—*Arco,* 43 p., paper, 50 cents (Cloth: $1.50).

WALDO AND MAGIC, INC.—Robert A. Heinlein—*Doubleday,* 219 p., $2.50. A science-fiction novel including fantasy, humor, and science. The story of a physically ugly individual who has a terrific brain.

WALLBOARD PRODUCTION AND USES: Report of Conference at Cambridge, Mass., September 16, 1949—*Northeastern Wood Utilization Council,* Bull. No. 31, 183 p., illus., paper, $4.00. A one-day conference on utilizing the waste from wood-using plants and supplementing our lumber supply. Held in cooperation with Harvard University.

YOUNG PEOPLE'S BOOK OF JET PROPULSION—Frank Ross, Jr.—*Lothrop,* rev. enlarged ed., 163 p., illus., $2.75. For young people who have an interest in jet propulsion. Many valuable illustrations.

A balanced, informative picture of the whole field of . . .

SUGAR

Its Production, Technology, and Uses

ANDREW VAN HOOK. The essential facts, clear and complete, about the growth, processing, and refining of sugar; the scientific basis of its technology; and its many and diverse uses, both present and potential. Gives a broad understanding of the industry as a whole, as well as the fascinating history of sugar. *"A very necessary addition to popularized science."*—Chemical & Engineering News. *Illustrated.* **$3.00**

Meat and Meat Foods

LLOYD B. JENSEN. *Just published.* A non-technical account of the processes that bring meats from the meat plant to the consumer's kitchen in sanitary and appetizing condition. Includes freezing, curing, smoking, prevention of spoilage, definite rules for safe storage and handling in the market and the home, and the place of meat in the diet. Much useful information for meat plant men, meat dealers, consumers, dietitians, and others in related fields. **$3.75**

Microbes Militant

FREDERICK EBERSON. The story of modern preventive medicine and control of infectious diseases. A significant, informative report, summarizing the whole new field of microbiology, including the new antibiotics. *"An excellent job."*
—Amer. Medical Assoc. Journal. **$4.50**

Microbes of Merit

OTTO RAHN. The "hero" microbes so essential to our civilization, to whom we owe bread, cheese, plastics, explosives, and even penicillin. *"A fascinating story of the part that good microbes play."*
—N. Y. Herald Tribune. **$4.00**

Hidden Hunger

I. G. MACY and H. H. WILLIAMS. The broad aspects of nutrition, and its relation to health and long life. Food habits, fads, and fashions. *"Skillfully written and scientifically accurate."* — Amer. Journal of Medical Sciences. **$4.00**

Order on examination. Money refunded if books returned in 5 days. Address Dept. 177

THE RONALD PRESS COMPANY
15 East 26th Street, New York 10

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 504. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

⚙ *PORTABLE DISHWASHER, which opens like the trunk compartment of an automobile, can be set on the sink drainboard and connected by hose to the faucet. Operated on water-pressure principle, using no motors, it contains twin multi-jet spinners and a siphon-type detergent chamber.*
Science News Letter, February 18, 1950

⚙ *TABLE TOP for the family dinette is made of a rock-hard material fused into a sheet of steel. It will not warp, peel, fade in color or stain, and will not be injured by a sizzling hot pan, or a hot iron. Also, it is clatter-proof and quiet.*
Science News Letter, February 18, 1950

⚙ *REFLECTOR LAMP, suitable for use in lighting outdoor billboards and signs and for general flood-lighting, is an incandescent type five inches in diameter. This is enclosed in a heat-resistant glass bulb which absorbs the thermal shocks from rain, snow and insects.*
Science News Letter, February 18, 1950

⚙ *RUBBER DUCKLING is a bath toy with a practical purpose, as shown in the picture. Made of extra soft natural rubber, the duck's body has a color-fast top edge-sealed to a natural color bottom, forming a space into which soap may be inserted.*
Science News Letter, February 18, 1950

⚙ *CARPET SWEEPER has a plastic window in its cover so that the user will know when the dust holder needs emptying. This new sweeper also has pivoted double-acting combs that run through the brush as the sweeper is operated to comb dust, fluff and lint into the pan.*
Science News Letter, February 18, 1950

⚙ *RADAR SPEED DETECTOR, for recording traffic speeds, has a transmitter-receiver unit, an indicator-amplifier unit and a power unit. Microwave radio frequency radiation is beamed at the advancing or receding vehicle and reflected back from the car to the receiver. True speed is given on a scale.*
Science News Letter, February 18, 1950

⚙ *RADIOACTIVITY DETECTOR, pocket-sized, provides a simple means of positive detection of radioactivity in all ores of uranium or thorium, without use of batteries, amplifiers or radio tubes. It utilizes a highly efficient optical system and a newly developed phosphor screen.*
Science News Letter, February 18, 1950

⚙ *ELECTRIC RANGE, for the small apartment kitchen, has the appearance of a knee-hole desk, but has four surface cooking units, a work surface and a full-size oven. The knee-hole "tuck-away" space is suitable to store a kitchen stool or wastebasket.*
Science News Letter, February 18, 1950

Do You Know?

The name *"platinum"* is derived from Spanish meaning "little silver."

Rocket fuels, which at low altitudes and moderate temperatures ignite with ease, may refuse to ignite at all at high altitudes.

Soil fumigation is becoming common practice on American farms; it involves putting special chemicals well into the soil to kill harmful bacterial and animal life.

Pipe lines to bring *natural gas* from the Southwest into New York metropolitan area and northern New Jersey will be ready for use this year.

By dissolving casein from milk in sodium hydroxide solution and forcing the result through minute nozzles into an acidulated formaldehyde solution, an *artificial wool* is formed.

Small quantities of *sodium dichromate* mixed with the salt spread on city streets to clear them of snow and ice neutralize the corroding action of the salt on automobile fenders and do not injure tires.

We wish to serve you—

LET US ORDER YOUR BOOK

Don't Delay

getting that NEW BOOK you want to read. SCIENCE NEWS LETTER will gladly obtain for you any American book or magazine in print. Send check or money order covering regular retail price ($5 if price is unknown and adjustment will be made). We will pay postage in the United States. You can attach a separate sheet, listing title, author, publisher, price, to your address coupon at right and mail to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C.

Book Order

SCIENCE SERVICE
1719 N Street N. W. • Washington 6, D. C.

Clip and enclose this address imprint whenever you write us to renew your SCIENCE NEWS LETTER subscription, change address, order other materials, etc. It identifies you as one of the SNL family. Lower line date is expiration. Allow three weeks for address change.

DETROIT PUBLIC LIBR
TECHNOLOGY DEPT
5 PUTNAM AVE
DETROIT 2 MICH
DTC 50 366-144 4